

Making Markov chains less lazy

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There are only a few methods for analysing the rate of convergence of an ergodic Markov chain to its stationary distribution. One is the canonical path method of Jerrum and Sinclair. This method applies to Markov chains which have no negative eigenvalues. Hence it has become standard practice for theoreticians to work with lazy Markov chains, which do absolutely nothing with probability $1/2$ at each step. This must be frustrating for practitioners, who want to use the most efficient Markov chain possible.

I will discuss how laziness can be avoided by the use of a twenty-year old lemma of Diaconis and Stroock's, or my recent modification of that lemma. As an illustration, I will apply the new lemma to Jerrum and Sinclair's well-known chain for sampling perfect matchings in a bipartite graph.